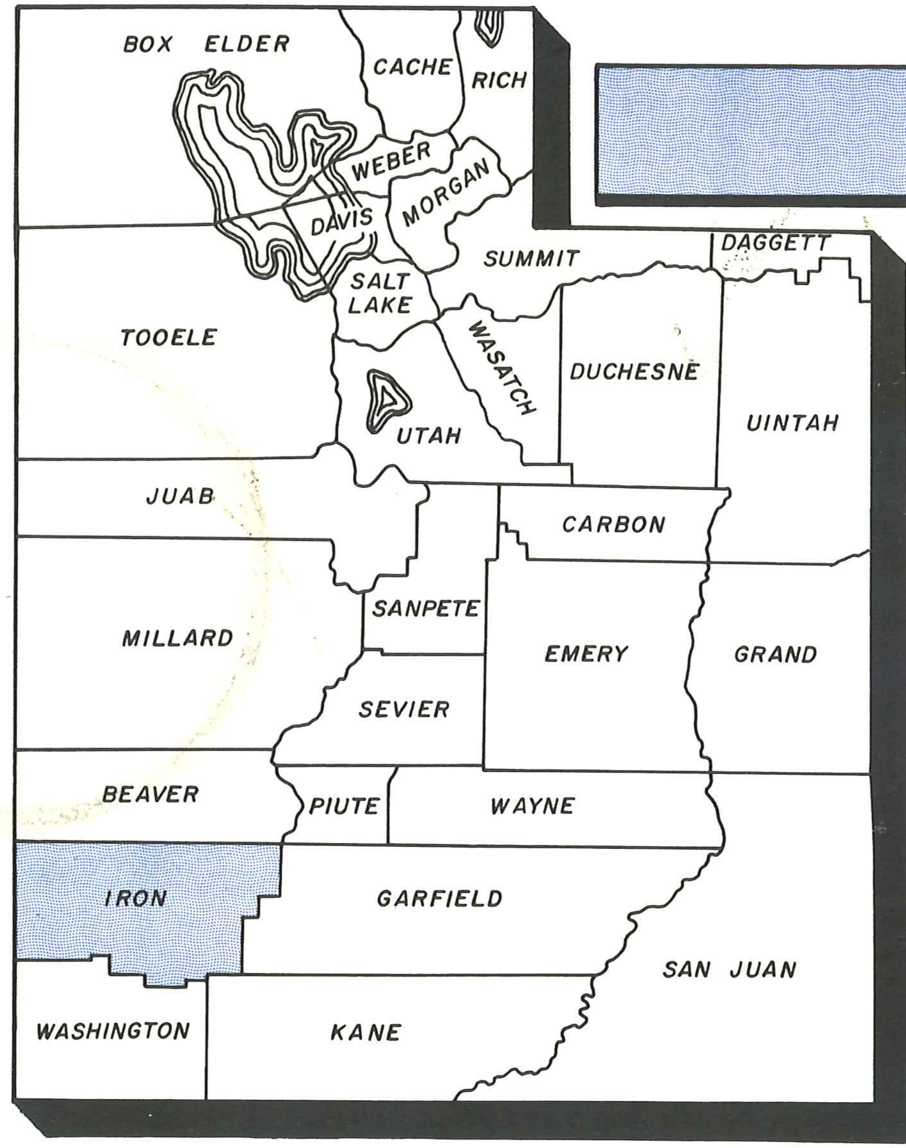
MATERIALS INVENTORY



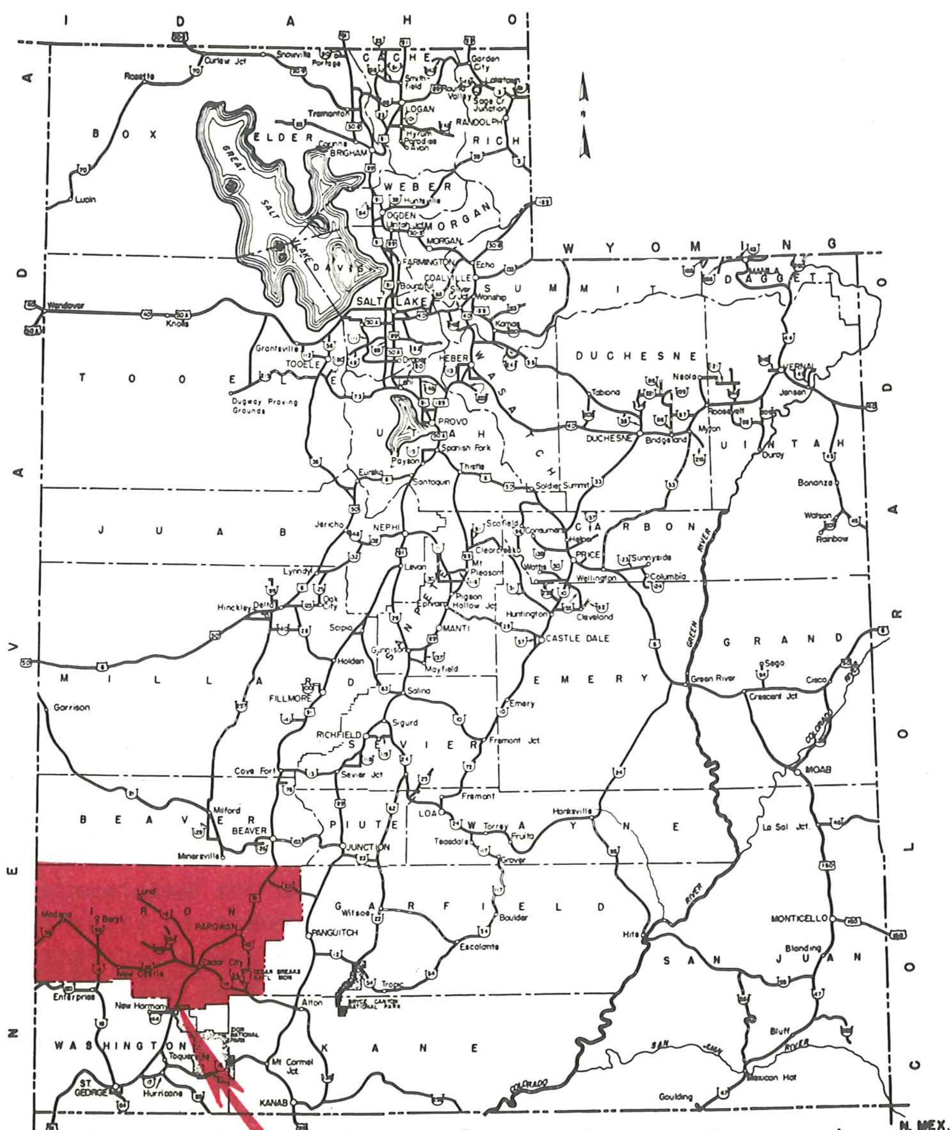
IRON COUNTY

UTAH STATE DEPT. OF HIGHWAYS
MATERIALS & RESEARCH DIVISION
MATERIALS INVENTORY SECTION

- POTENTIAL SOURCES
- PIT LOCATIONS
- TEST DATA
- GEOLOGY

MATERIALS INVENTORY

IRON COUNTY



LOCATION OF COUNTY

REVISED AUGUST 1971

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PURPOSE

The purpose of the Materials Inventory is twofold. First, it enables the Utah State Department of Highways to more accurately locate, investigate, and catalog the materials needed for highway construction. Second, it makes possible a system by which an accessible, permanent, and up-to-date record may be kept on every known materials site.

The inventory is valuable in avoiding wasteful duplication of work in locating materials sites. General information on known materials sites and prospective sites will be available on a county basis in booklet form. More detailed information is available from a central file in the Materials Inventory Section of the Materials and Research Division and in the respective District Materials Sections.

Notwithstanding the enormous quantities of road-building materials that are now available in Utah, it must be realized that one day these materials may be depleted or completely unobtainable due to the encroachments of man. As highways improve, the quality of materials used in highway construction must also improve. Good quality material is not readily available in all places, and this fact alone makes it necessary to locate and secure choice sites before they are depleted or become unobtainable. The advent of the Federal Highway Program has further emphasized the necessity for large quantities of high quality material for highway construction. The Materials Inventory is designed to collect, organize and tabulate all useful information related to materials available or potentially available for highway construction.

PROCEDURES

The Materials Inventory is accomplished by a logical step by step sequence as follows:

1. Compilation of all available site data from existing files and records.

2. Acquisition of available geologic and soil map coverage of the county.

3. Plotting the above information on 1 inch = 1 mile county maps.

4. Field examination of each site to determine quantities available, to collect samples as needed, to check geologic and soil contacts, and to observe the physical setting for feasibility of material removal.

5. Preparation of the finished report.

6. Establishment of a permanent record in the Materials Division and District files to include detailed information concerning each site.

To assist in accomplishing the foregoing results, three special forms have been prepared, all of which become part of the permanent records. These forms provide details concerning the individual sites. One copy of each form is kept in the District files and one copy in the Central Materials Inventory files. The MI-1 form is designed to assist in compiling available file data and in making the field examination. A copy of this form is illustrated in Figure 1-a. It contains information relating to the approximate grading, type of material, type of deposit, rock types, surface conditions of the site (indicating obstructions to excavation, etc.), area, accessibility of the site, quantity, site number, ownership, and location. This is a specially designed form of "Needle Sort" printed by Business Forms, Inc. Notice the edges of this card. By punching or notching the card according to the code (Figure 1-b) and using the sorting needle, it is possible to rapidly sort, arrange, classify or select any information recorded on any card or group of cards in the filing system. The "Needle Sort" instruction manual gives detailed instruction as to the operation and use of this system and the reader should refer to this manual for more detailed information.

Form MI-1 is completed by the investigator as he visits each site. If laboratory test data are not available, the investigator collects a representative sample of the material, upon which laboratory tests are later performed to determine its suitability for use in highway construction.

Pertinent information from these test data is recorded on Form MI-2 (see Figure 3). This form also includes a sketch map of the deposit showing the tract subdivision, outline of the material site, drill holes, other sampled locations and information such as direction and distance from a survey station or highway. Drill hole or other sample information is logged in the columns below the sketch map.

The MI-3 form (see Figure 2) is designed to aid in the maintenance of current records. It is to be completed by the project engineer after pit operations have ceased. Included on the form are items such as quantity removed; the type, size and quality of material; and physical factors involved in pit operation.

The finished county report contains a sheet designated as "Description of Geology", describing the various geologic and soil units in detail. Following this is the "Pit Locations and Potential Sources Map". As might be inferred, this shows the location of known sites by number and symbol on a geological map, all placed on a county highway map base. The geologic information shown on the "Pit Locations and Potential Sources Map" represents a compilation from various published and unpublished sources, after field checking in pertinent areas.

MATERIALS INVENTORY FORMS

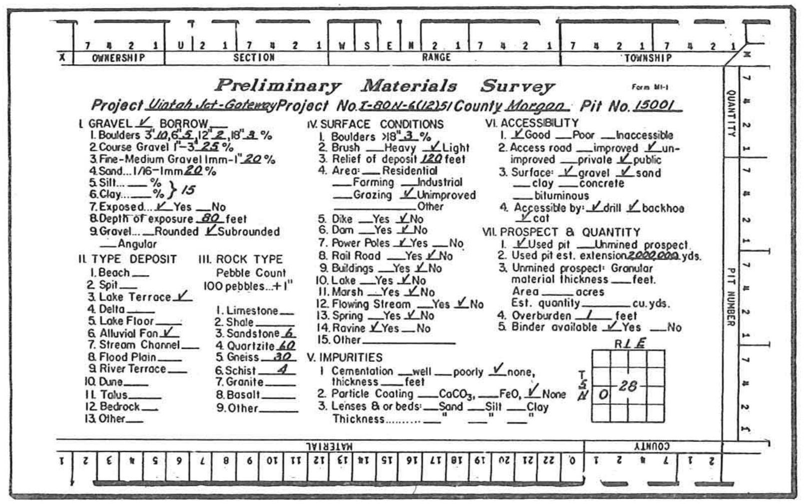


Figure 1-a. Reproduction of the Preliminary Materials Survey Form MI-1 on the Needle-Sort card. The actual card is 8 x 5 inches.

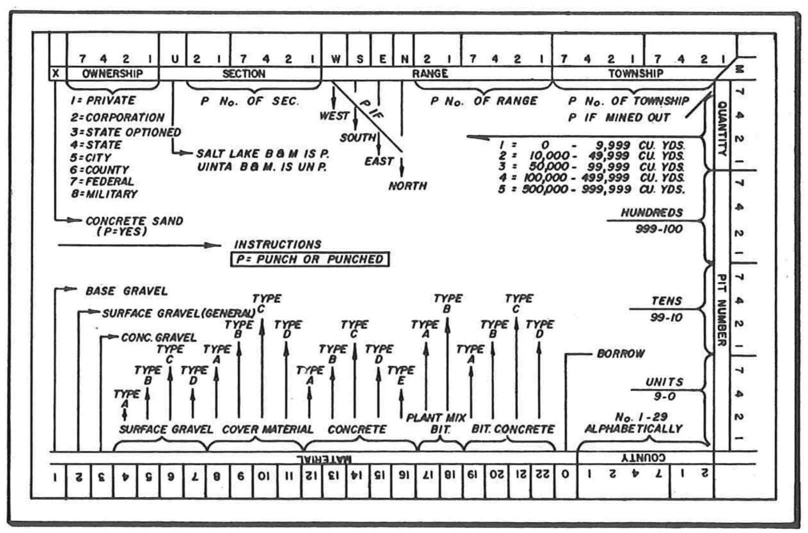


Figure 1-b. Reproduction of code card used in punching Form MI-1. The actual card is 8 x 5 inches.

Form MI-3
(Rev. 6-64)

PIT EVALUATION REPORT

To: Engineer of Materials and Research

Project Name & No.________________ Date________

Pit or Prospect No.__________ Station Location__________

Legal Description__________________

TYPE OF MATERIAL	MATERIALS REMOVED (CU. YDS.)
Base Gravel..................................	
Surface Gravel (Type).....................	(Cu. Yds. or Tons)
Concrete Sand...............................	
Concrete Gravel..............................	
Bituminous Surface Course Aggregate.......	
Granular Backfill Underdrain...............	
Borrow...	
Other Material (Rip Rap, Chips)...........	
Total Gravel Removed	

Comments:

Quality of Material__________________

Uniformity of Material__________________

Lenses..........gravel________sand________silt________Clay Thickness________

Amount of Oversize (+12")______% Average thickness of Overburden__________

Estimated Quantity Remaining______________cu. yds.

Further Investigation necessary to determine remaining quantity: yes______no______

Features of Pit:__________________

Difficulties of Operation:__________________

Recommendations for Future use of Pit:__________________

cc: District Materials Engr. By:________________
Project Engineer

Figure 2. Reproduction of the Pit Evaluation Report Form MI-3. The actual form is 8 1/2 x 11 inches.

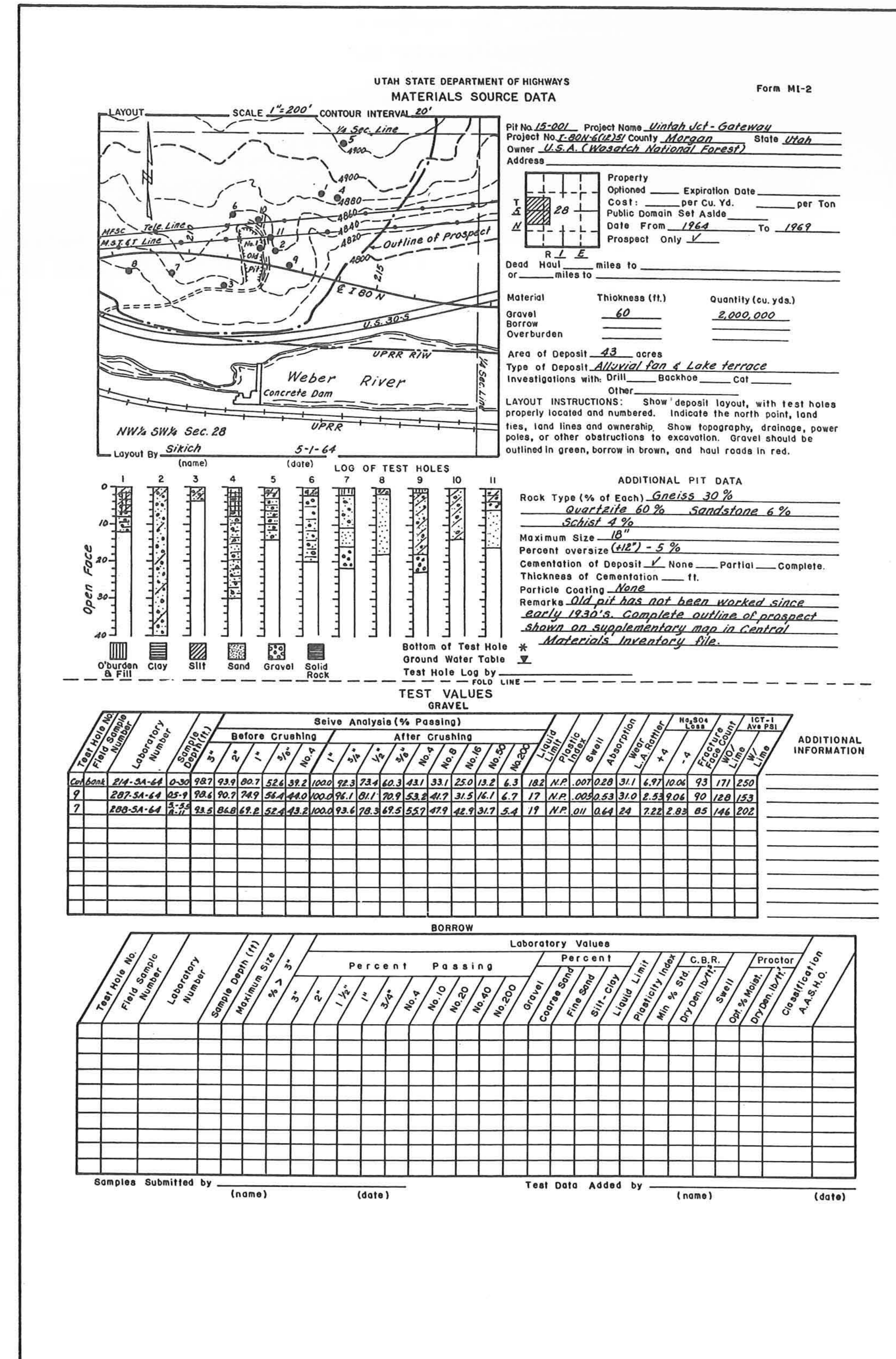


Figure 3. Reproduction of the Materials Source Data Form MI-2. The actual form is 11 x 17 inches.

Test information for samples obtained from each site is summarized on the "Test Data Sheet", with the corresponding pit number for identification.

Through proper use of the geologic maps, the description of geologic units, and test information, the locations of additional possible sites may be inferred.

Certain pits may contain both gravel and borrow material, making it difficult in many cases to label the material collected as representative of the pit. This also leaves some doubt as to whether a pit should be called a gravel pit or a borrow pit. As a general rule, it is assumed that any pit capable of producing gravel can be used for borrow if conditions warrant. Consequently, a pit capable of producing satisfactory gravel is normally shown as a gravel pit on the "Pit Locations and Potential Sources Map" even though it may be primarily used for borrow.

In many areas, especially where quality gravels are scarce, many sites are investigated and sampled only to find that they do not meet standard specifications for base or surface gravels. In order to avoid wasteful duplications in re-investigating and re-sampling these deposits, they are shown as rejected gravel sites on the "Pit Locations and Potential Sources Map". Rejection of these sites is usually based on excessive wear, swell, liquid limit, plasticity or sodium sulfate loss or failure to pass the immersion-compression test. Grading is seldom a requisite for rejecting a deposit because it is assumed that any coarse aggregate can be processed to meet standard grading specifications by crushing, blending or wasting part of the material. Potential borrow sites are rejected only if there is better quality material available in the immediate area. A separate "Test Data Sheet" giving the reason for rejection as well as the laboratory test values is used for the rejected sites.

REPORT PREPARATION

Materials for the Iron County Materials Inventory were mapped by geologists from the Materials Inventory Section, Materials and Research Division, Utah State Department of Highways during the months of September 1964 and January 1965.

In the Escalante Valley area of western Iron County mapping of the various soils shown on the "Pit Locations and Potential Sources Map" is based largely on the "Soil Survey of the Beryl-Enterprise Area" published by the U. S. Department of Agriculture. Detailed soil surveys for other parts of the county are not available; consequently mapping of the various soils in these areas is more general.

GEOLOGICAL ASPECTS

Geography and Physiography

Iron County covers an area of approximately 3300 square miles in southwestern Utah. The climate is semiarid and no major streams persist in the county.

Physiographically the western two-thirds of Iron County is within the Basin and Range province. The Escalante Desert, a shallow, semiarid basin surrounded by volcanic highlands, occupies approximately three-fourths of western Iron County. Elevations range from under 5100 feet to over 9000 feet. The elevation of most of the volcanic highlands is less than 7500 feet.

The eastern one-third of Iron County consists of rugged highlands which form part of the Colorado Plateau physiographic province. For convenience, this area is referred to as the Kolob Terrace.

The Hurricane Cliffs, an escarpment 3000 feet high in some areas, separates the Kolob Terrace from the lower lands of the Basin and Range province. Elevations range from 5800 feet at the base of the Hurricane Cliffs to over 11,000 feet at Brian Head.

General Discussion

Precambrian rocks are not exposed in Iron County. Lower Paleozoic outcrops are exposed only in isolated thrust-plates in northwestern Iron County. They are not considered significant potential aggregate sources because of their remoteness and limited areal extent.

Upper Mississippian, Pennsylvanian, and Lower Permian rocks do not crop out in Iron County. Upper Permian outcrops are restricted to isolated areas at the base of the Hurricane Cliffs east of Kanarraville.

Triassic rocks are restricted to the Hurricane Fault zone; however, their area of outcrop is much more extensive than that of the Permian rocks. A marine limestone near the base and a conglomerate near the center form the only potential aggregate sources in the Triassic section.

Jurassic rocks crop out in three locations: along the eastern margin of the Kolob Terrace, in the Iron Mountain district, and in the Wah Wah Mountains. The lower part consists of cross-bedded, eolian sandstone which forms spectacular cliffs. The upper part consists of limestone, sandstone, siltstone, mudstone, and gypsum deposited in a mixed marine and nearshore environment. Most of the Jurassic rocks are too soft to be considered potential aggregate sources.

Cretaceous strata crop out in the Kolob Terrace and the Iron Mountain district. The section in the Kolob Terrace consists of sandstone, sandy shale, conglomerate, and coal deposited largely in a nearshore environment. These are overlain by thin-bedded sandstones with lesser amounts of siltstone, limestone, and conglomerate which were deposited by streams and in small fresh-water lakes.

The Cretaceous section in the Iron Mountain district was deposited in a continental environment and is composed of conglomerate and coarse sandstone with minor amounts of shale and limestone. Pebbles in the conglomerate are similar to those in the Triassic conglomerates and were derived, most likely, from the same Precambrian and Lower Paleozoic sources. Except for these conglomerates, the Cretaceous sediments are too soft to be considered good aggregate sources.

Tertiary sedimentary rocks are most prominently exposed on the Kolob Terrace, although smaller outcrops are scattered throughout the county. Except for isolated outcrops of Miocene age occurring in the extreme southwestern part of the county, the Tertiary sediments are believed to be of Eocene and possibly, Paleocene age. The deposits consist of conglomerate, sandstone, lacustrine limestone, and reworked volcanic ash and tuff. Pebbles in the conglomerates are similar to those in the Cretaceous and Triassic conglomerates and were most likely derived from them.

Tertiary extrusive rocks form the bulk of the bedrock exposed in Iron County. Volcanic activity appears to have started in central Nevada near the end of Eocene time and spread over the entire southwestern Utah and adjacent Nevada area during later Tertiary time. Extrusive activity was most intense during the Oligocene. The volcanics are mainly of acidic or intermediate composition and occur as ignimbrites (welded tuffs), flows, and pyroclastics.

Extrusion of rocks of predominantly basaltic composition began late in the Tertiary Period and continued well into the Recent Epoch. The latest evidence of volcanic activity is manifest in cinder cones which occur near the edge of the Hurricane Cliffs. Ash has obscured the underlying basalt in the immediate area of the cones. The bulk of the gravels in the aggregate deposits is derived from Tertiary volcanic rock.

The oldest Quaternary sediments in Iron County are alluvial fans and related deposits. Lacustrine gravel, sand, and clay related to Lake Bonneville was deposited over much of the Escalante Valley during the Pleistocene Epoch. Recent alluvium consists of alluvial fans, valley fill, sand dunes, stream channel and floodplain deposits. Talus and landslides form minor deposits in areas of steep relief.

Origin and Distribution of Aggregates

The most extensive gravel deposits in Iron County are found in alluvial fans and related alluvial plains formed by coalescing fans. From a highway construction standpoint, the most important of these are developed along the base of the Hurricane Cliffs east of U. S. Highway 91 (I-15). Most of the gravel in these fans is derived from Mesozoic and Tertiary conglomerates. The pebbles are composed of quartzite and sandstone with lesser amounts of limestone, quartz, chert, and assorted volcanics. Locally, where Tertiary volcanic rock caps the Hurricane Cliffs, the gravel in the fans consists almost entirely of basalt.

Alluvial fans are also extensively developed along the margins of the Tertiary volcanics which form highlands throughout the county. Gravel in these fans is composed almost entirely of assorted volcanic rocks. Basalt, olivine basalt, rhyolite, andesite, trachyte, and welded tuffs predominate. Obsidian is locally abundant and traces of chert, opal, chalcedony, jasper, and other varieties of quartz are commonly found. Because several of these rock types, especially rhyolite, dacite, andesite, opal and chalcedony react deleteriously with cement, many of these gravel deposits may not be suitable for concrete aggregate.

Lake terrace gravels deposited along the margins of the estuary of Lake Bonneville that extended into Escalante Valley are sometimes found as low gravel ridges. More often the lake gravels are buried under several feet of finer-grained material. Because these buried gravels are seldom reflected in the topography, drilling is the best method of locating them. Gravels exposed in the banks of dry washes often indicate potential gravel sources. Detailed soil maps, which may aid in locating buried gravel deposits, are available for most of the area underlain by lacustrine gravels.

The lacustrine gravels are composed primarily of acidic and intermediate volcanics with lesser amounts of basalt, quartzite, and limestone. They can be recognized as lake deposits because of definite bedding planes which generally are not apparent in alluvial deposits.

Sand dunes cover extensive areas in the northern part of the Escalante Valley. They are composed of fine-grained quartz sand that is suitable for borrow.

Cinder cones surrounded by volcanic ash are found in several areas near the Hurricane Cliffs. Where they are accessible from the highways, they form potential aggregate deposits. In the past they have been used mainly for maintenance and local building block construction.

DESCRIPTION OF GEOLOGY

Qar

Recent alluvium & colluvium

Channel and flood plain deposits related to active streams, recent alluvial fans, talus, and landslide debris; generally form potential aggregate sources where present in sufficient quantity.

Qds

Dune sand deposits

Brown, highly calcereous, moderately coarse sands; form dunes ranging from 5 to 30 feet high; generally elongated in a northeast-southwest direction; most appear to be stabilized at the present time; potential sources of borrow.

TQf

Fanglomerate

Latest Tertiary; pebbles, cobbles, and boulders of quartzite, limestone and assorted volcanics; remoteness from anticipated highway construction limits its value as aggregate.

Tva

Andesite - trachyte - latite

Early Tertiary flows, ignimbrites, and pyroclastics, and Late Tertiary flows and pyroclastics; includes the latite ignimbrites of the Needles Range Formation, the andesitic-latite ignimbrites of the Isom Formation, the latitic breccias, tuffs and flows of the Bullion Canyon Formation, and equivalents of the Page Ranch Formation of the Bull Válley District; forms potential aggregate sources.

Qag

Gravelly soils

River and lake terrace deposits, alluvial fans, alluvial plains, gravel covered pediments, and valley fill (bolson) deposits; form the principle sources of aggregate in Iron County.

Qls

Landslide deposits

Found mainly along the Hurricane Cliffs; the largest slides are developed in soft shales of the Tropic Formation; not considered potential aggregate sources.

Tmc

Muddy Creek Formation

Miocene(?); vari-colored clay, silt, and sand with some evaporites; not a potential aggregate source.

Tb

Basalt & basaltic andesite

Flows and breccia of Early and Late Tertiary age; includes the Roger Park breccia; may be considered a potential aggregate source.

Qas

Sandy & silty soils

Fluvial and lacustrine deposits; generally found in the lower end of gently sloping alluvial fans which coalesce to form alluvial plains, in abandoned flood plains and terraces, and in near shore areas of lake deposits; often contain lenses of gravel too small to be mapped; form potential borrow sources.

Qb

Quaternary basalt

Flows, dikes, and cinder cones of dark gray to black olivine basalt; texture ranges from hard, dense to scoriaceous; may be considered future aggregate sources.

Tcl

Claron Formation

Eocene (?); basal conglomerate consisting of chert, quartzite, and limestone pebbles in a calcareous sandstone matrix; middle unit of red earthy limestone alternating with pebbly conglomerates and red shales; upper unit of white, pure to silty, thick-bedded, lacustrine limestone; includes units mapped as the Wasatch Formation and as the lower part of the Brian Head Formation; alluvial fans derived from the basal conglomerate form potential aggregate sources.

Tvu

Volcanic rocks undifferentiated

Includes extrusive Volcanic Rocks not included in the above groups.

Qlc

Clayey soils

Lacustrine sediments deposited in offshore areas of Lake Bonneville and related Pleistocene lakes and in more recent playa lakes; often contain alkaline salts or other evaporites; generally not suitable for borrow.

Qa

Volcanic ash & cinders

Thick deposits of dark-red to black volcanic ash and cinders surrounding Quaternary cinder cones; potentially a source of highway aggregate.

Tvr

Rhyolite-dacite-quartz latite

Early and Late Tertiary flows and ignimbrites (welded tuffs); includes the rhyolitic ignimbrites of the Quichapa Formation, and the acidic volcanics capping the Brian Head Formation; forms potential aggregate sources.

Tip

Porphyritic quartz monzonite

Stocks and fissure type veins associated with the iron ore deposits of the Iron Mountain - Granite Mountain district; forms excellent aggregate.

Ku

Cretaceous undifferentiated

Includes strata correlative to the Tropic, Straight Cliffs, and Wahweap Formations, which in several areas, grade into one another so that the individual formations cannot be differentiated; not considered a potential aggregate source.

Kka

Kaiparowits Formation

Upper Cretaceous; gray, brown, and white coarse-grained arkosic sandstones, sandy shales, and thick conglomerates; forms badland slopes and strong cliffs; the resistant sandstones and conglomerates may be considered potential aggregate sources.

Kws

Straight Cliffs & Wahweap Sandstones undivided

Upper Cretaceous; grayish-yellow to light orange, fine-grained, massive, cliff-forming sandstone in beds 5 to 40 feet thick; grades upward into nonresistant, slope-forming shale, siltstone and sandstone; cliff-forming sandstone in lower part may be considered a potential materials source.

Kt

Tropic Formation

Upper Cretaceous; light- to dark-gray shale with thin interbedded yellowish-orange, fine- to medium-grained sandstone and coal; forms slope; not considered a potential aggregate source.

Kis

Iron Springs Formation

Upper (?) Cretaceous; lenticular beds of coarse, gray, brown, and red sandstone; quartz-pebble conglomerate in a gray quartzitic matrix, and variegated, fresh-water limestone; may be considered potential aggregate source.

Jsr

San Rafael Group

Upper Jurassic; light-gray, shaly, very thin-bedded, locally fossiliferous limestone and light-gray to red-brown, soft, slope-forming sandstone with interbedded red-brown siltstone, mudstone and massive gypsum; includes the Carmel, Entrada, Curtis and Windsor Formations; limestone units may be considered potential aggregate sources.

JTRgc

Glen Canyon Group

Triassic (?) and Jurassic; reddish-orange, fine- to medium-grained, poorly-cemented sandstone with interbedded reddish-brown siltstone, mudstone, and sandstone in the lower one-half; includes the Moenhave, Kayenta, and Navajo Formations; sandstones are too friable to be considered potential aggregate sources.

TRc

Chinle Formation

Upper Triassic; variegated light-gray to grayish-red, non-resistant mudstone and siltstone intercalated with thin beds of soft sandstone; not a potential aggregate source.

TRs

Shinarump Conglomerate

Middle (?) Triassic; gray, coarse, cross-bedded sandstones with lenses of gray and brown conglomerate; forms narrow ridge or vertical ledge; forms a potential aggregate source.

TRm

Moenkopi Formation

Lower Triassic; light-red to brown, shaly sandstone and mudstone interbedded with white, pink, sandy, gypsiferous shale and blue-gray, fossiliferous, bedded limestone; gray, coarse conglomerate at the base; divisible into six units; not considered a potential aggregate source.

Pk

Kaibab Limestone

Permian; blue-gray, white to yellowish, massive, locally-dolomitic limestone; crops out in narrow bands at the base of the Hurricane Cliffs east of Kanaraville; could be used for aggregate if needed.

Mr

Redwall Limestone

Lower Mississippian; gray limestone with brown to red, bedded chert; exposed in a fault block in the southern part of the Needles Range; aggregate potential restricted because of remoteness.

Ds

Sevy Dolomite

Lower Devonian; white to pink, dense dolomite and yellow, coarse-grained dolomite; only outcrop is adjacent to the Laketown dolomite; not considered a potential aggregate source.

Sl

Laketown Dolomite

Silurian; alternating beds of light and dark gray dolomite; outcrop is restricted to the southern part of the Needles Range in the northwestern part of the county; too remote to be considered a potential aggregate source.

Ofh

Fish Haven Dolomite

Upper Ordovician; alternating light-gray and black dolomite; restricted to southern Needles Range; not considered a potential aggregate source.

Oe

Eureka Quartzite

Middle Ordovician; white to tan, fine-grained quartzite; also restricted to Needles Range; not considered a potential aggregate source because of its isolation and limited extent.

Op

Pogonip Formation

Middle Ordovician; alternating beds of limestone, siltstone, and shale; restricted to isolated outcrops in the southern part of the Needles Range in northwestern Iron County; too small and too isolated to be considered potential aggregate sources.

€un

Cambrian undivided

Middle and Upper Cambrian; alternating light- and dark-gray dolomite in the upper three-fourths; dark-gray limestone and thin, olive shale beds in lower one-fourth; restricted to the southern end of the Wah Wah Mountains northwest of Lund; may be used as aggregate if needed.

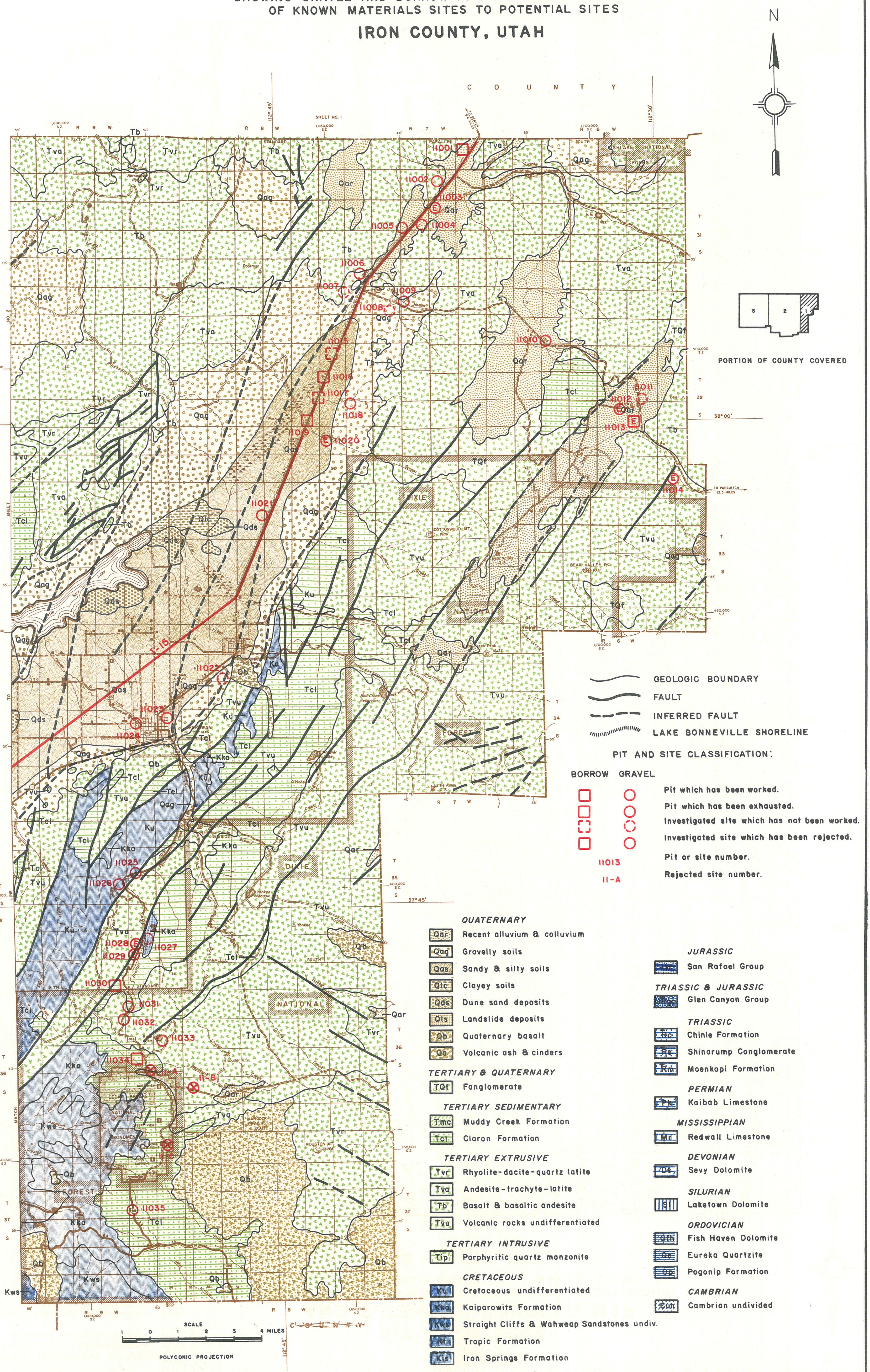
STATEMENT OF LIABILITY

No liability is expressed or implied concerning the quality or quantity of material listed for the respective sites. The data itemized are based upon sound geologic and/or geophysical interpretations in combination with tests performed upon material removed from the site, but due to the erratic depositional features of such deposits, this does not in any way guarantee that the material remaining is represented by the information obtained to date.

UTAH STATE DEPARTMENT OF HIGHWAYS
MATERIALS AND RESEARCH DIVISION
MATERIALS INVENTORY SECTION

GENERAL GEOLOGY FROM 1961 GEOLOGIC MAP OF UTAH
DRAFTED BY I. OSPINA

1965
PIT LOCATIONS AND POTENTIAL SOURCES MAP
SHOWING GRAVEL AND BORROW PITS AND THE RELATIONSHIP OF KNOWN MATERIALS SITES TO POTENTIAL SITES
IRON COUNTY, UTAH



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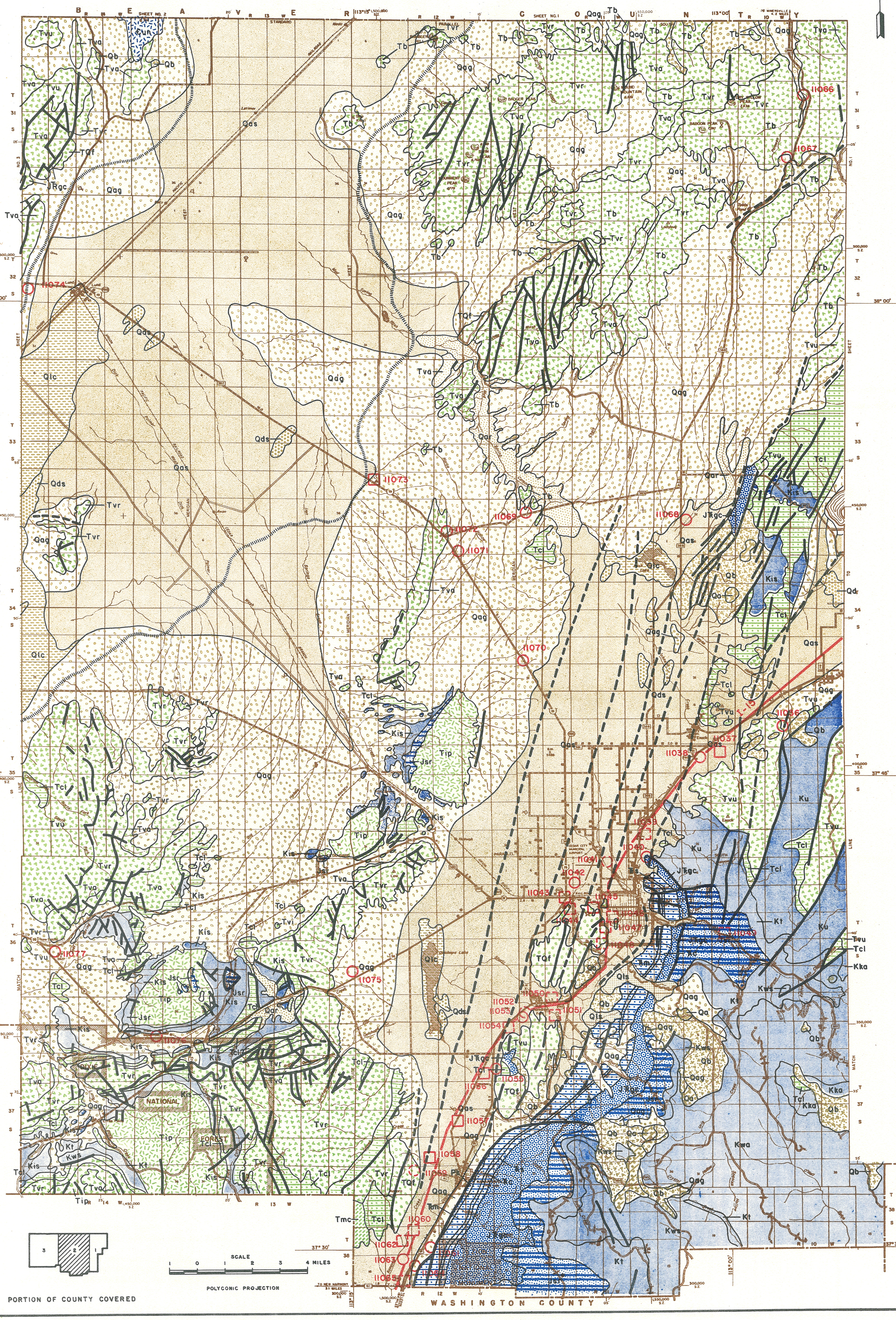

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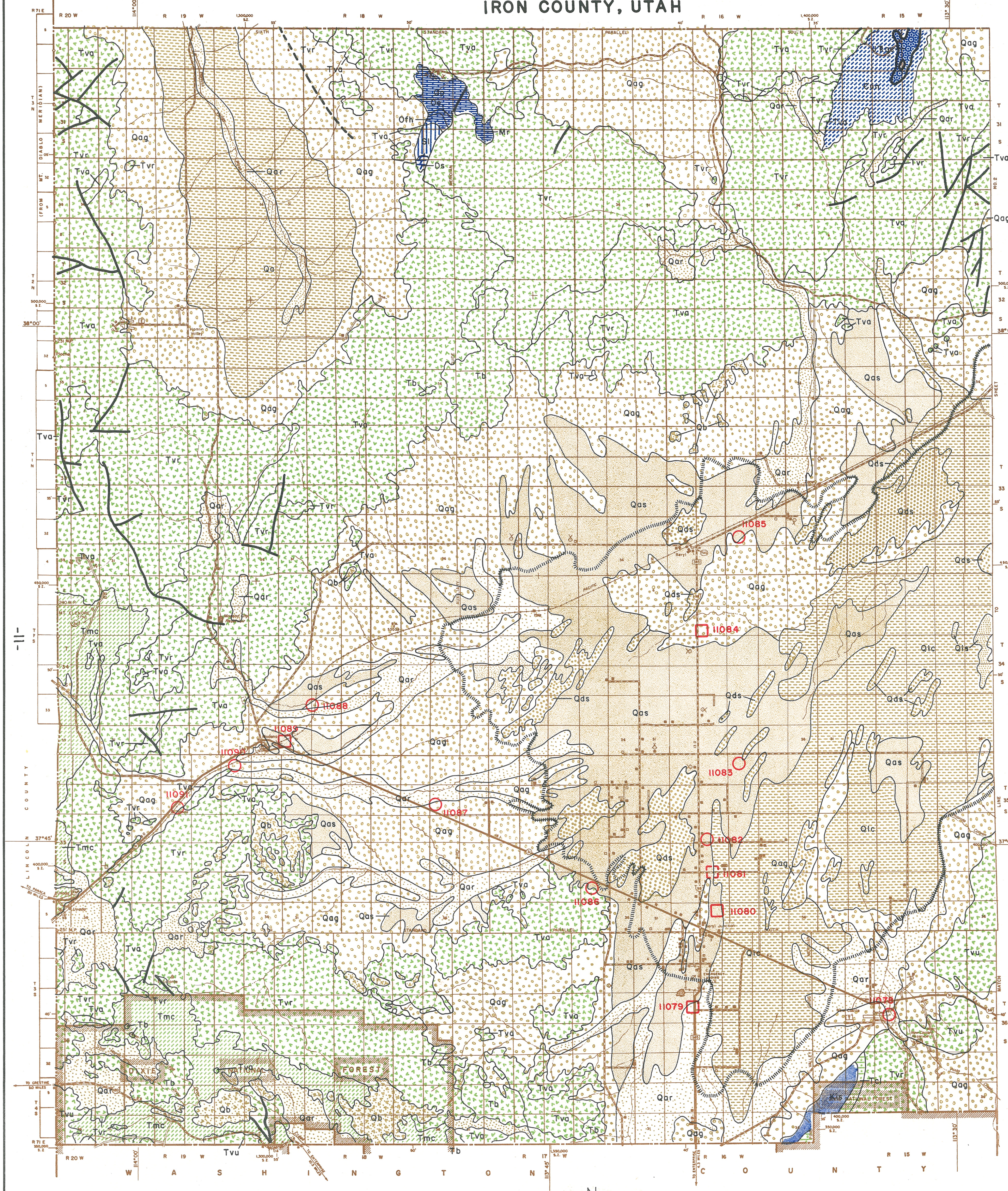
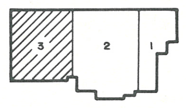


GEOLOGIC BOUNDARY
FAULT
INFERRED FAULT
LAKE BONNEVILLE SHORELINE

PIT AND SITE CLASSIFICATION:

BORROW GRAVEL

Pit which has been worked.
Pit which has been exhausted.
Investigated site which has not been worked.
Investigated site which has been rejected.
11013 Pit or site number.
11-A Rejected site number.



PORTION OF COUNTY COVERED

SCALE
1 0 1 2 3 4 MILES
POLYCONIC PROJECTION

PITS AND POTENTIAL SITES-TEST DATA SHEET

LOCATION						OWNERSHIP		MATERIAL					TEST DATA-REPRESENTATIVE SAMPLE																			
																SIEVE ANALYSIS												IMMERSSION COMPRESSION AVG. P.S.I.			SODIUM SULPHATE LOSS	
																BEFORE CRUSHING		PERCENT PASSING AFTER CRUSHING TO 1" MAX. SIZE										LIME				
PIT OR SITE NUMBER	TOWNSHIP	RANGE	40 ACRE TRACT	QUARTER SECTION	SECTION	P = PRIVATE C = COMMERCIAL CO = COUNTY F = FEDERAL S = STATE	OWNER	USE OF MATERIAL	TYPE OF DEPOSIT	PRESENT ESTIMATED QUANTITY (CU. YDS.)	THICKNESS OF MATERIAL	DEPTH OF OVERBURDEN	DATE SAMPLED *	TYPE OF SAMPLE	DEPTH OF SAMPLE	> 3"	> 1"	1"	1/2"	NO. 4	NO. 10*	NO. 40*	NO. 200	LIQUID LIMIT	PLASTICITY INDEX	SWELL	A. A. S. H. O. CLASSIFICATION	WO/	W/	ABRASION 500 REV.	+4	-4
11001	31S	7W	SE	NW	2	S	Utah State Land Board	Bor.	Alluvial Fan	32,000	5	0	Not sampled - Additional Drilling Necessary to Obtain Representative Sample and Prove Additional Reserves.																			
11002	31S	7W	SW	NE	10	F	U.S.A.- B.L.M.	B.G.,S.G.	Alluvial Fan	270,000	10	1	1964*	Cut Bank		0.0	27.7	100	70.1	35.7	29.8*	12.9*	5.0	15	N.P.	.009	A-1-a			24.3	5.49	11.30
11003	31S	7W	NE	NW	15	F	U.S.A.- B.L.M.	B.G.,S.G.	Alluvial Fan	Mined Out	8	2	1951	Cut Bank		0.0	41.6	100		45.9	33.8	18.5	7.2	23	N.P.	.021	A-1-a			23.04		
11004	31S	7W	E½	SE	16	S	Utah State Land Board	B.G.,S.G.	River Terrace	15,000	7	0	1951	Cut Bank		4.6	38.2	100		45.6	30.1	15.5	5.7	27.4	N.P.	.020	A-1-a			22.42		
11005	31S	7W	NW	SW	16	S	Utah State Land Board	B.G.,Bor.	Alluvial Fan	15,000	15	½	1954	Cut Bank		10.0	35.0	100		56.0	48.0	35.0	18.0	20.9	N.P.	.015	A-1-b			22.1		
11006	31S	7W	SW	NE	30	F	U.S.A.- B.L.M.	Bor.,B.G.	Alluvial Fan	240,000	10	4	1964	Cut Bank		1.9	14.2	100	85.6	64.8	56.6*	21.7*	9.3	16	N.P.	.003	A-1-a			28.4	12.23	25.49
11007	31S	7W	NW	NW	31	F	U.S.A.- B.L.M.	Bor. B.G.,S.G.	Alluvial Fan	320,000	10	0-1	1954			10.0	36.0	100		57.0	49.0	24.0	13.0	18.9	N.P.	.015	A-1-a			28.1		
11008	31S	7W	SE	SE	32	F	U.S.A. - B.L.M.	B.G.,S.G.	Alluvial Fan	160,000	10	1	1954	Cut Bank			39.1	100		44.9	34.1	14.4	3.4	21.8	N.P.	0.0	A-1-a			26.7		
11009	31S	7W	NW	SW	33	F	U.S.A.-B.L.M.	Bor.,B.G.	Alluvial Fan	40,000	10	1	1964*	Cut Bank		0.5	13.5	100	78.0	55.0	44.0*	16.0*	7.0	19	N.P.	.013	A-1-a			27.0	14.58	23.79
11010	32S	6W	SE	SW	5	F	U.S.A.- B.L.M.	Bor.,B.G.	Alluvial Fan	64,000	10	1	1964*	Cut Bank		1.3	9.2	100	86.0	64.4	52.9*	25.4*	11.0	20	N.P.	.007	A-1-a	128	168	27.5	22.35	19.53
11011	32S	6W	SW	SE	14	F	U.S.A.- B.L.M.	B.G.,S.G.	Gravel Ridge	Ample			1955	Test Hole		22.8	55.7	100		40.5	31.5	20.1	8.3	23.5	N.P.	.070	A-1-a			23.9		
11012	32S	6W	SE	NE	22	F	U.S.A.- B.L.M.	B.G.		Mined Out			1952	Cut Bank	2-11	0.0	20.8	100		49.3	38.8	25.7	9.6	23.3	N.P.	.033	A-1-a			29.16		
11013	32S	6W	NE	SW	23	P		Bor.,B.G.	Talus	Mined Out			1958	Cut Bank		9.9	29.0	100		45.7	29.4	16.4	4.8	27.1	3.7	.039	A-1-a			22.0		
11014	32S	6W	NW	SE	36	S	Utah State Land Board	B.G.,S.G.	Stream Channel	Mined Out			1952			7.9	32.4	100		43.3	27.5	12.1	3.8	24.5	N.P.	.044	A-1-a			23.9		
11015	32S	8W	W½	NE	12	P	L. Tree; E. C. Olsen	Bor.	Stream Channel	Ample			1955	Test Hole		0.0	10.1	89.9	Not Crushed	73.9	67.6	51.6	13.7	19.3	N.P.		A-1-b					
11016	32S	8W		NW	13	P	E. C. Olsen	Bor	Valley Fill	100,000	2	0	1955	Test Hole	2-3	0.0	6.2	93.8	Not Crushed	68.0	67.3	44.3	12.0	20.0	N.P.		A-1-b					
11017	32S	8W		SW	13	P	E. C. Olsen Beaver Val.Co.	Bor.	Valley Fill	Ample			1954	Cut Bank	0-3	0.0	3.8	96.2		68.6	59.9	45.3	16.1	21.3	N.P.	.014	A-1-b					
11018	32S	7W	S½ N½	SW NW	18 19	F	U.S.A.- B.L.M.	B.G.,S.G.	Alluvial Fan	250,000	12	1	1954	Cut Bank	1.5-12		38.2	100		28.2	20.3	10.1	2.2	19.2	N.P.	.032	A-1-a			21.16		
11019	32S	8W	SW	NE	23	P		Bor.	Valley Fill	100,000	2		1955	Test Hole	2-3	3.2	9.4	93.8		68.0	67.3	44.3	12.0	20.0	N.P.		A-1-b					
11020	32S	8W	SE	NW	25			B.G.,S.G.	Stream Channel	Mined Out		0	1945	Cut Bank			25.0	100		30.5	24.1	12.8	3.0	19.3	N.P.	.031	A-1-a			25.14		
11021	33S	8W	SW NE	SW NE	3 9	P, F	R. L. Fenton, U.S.A.- B.L.M.	B.G.,S.G.	Alluvial Fan	Ample		0-2	1954	Test Hole			25.7	100		39.4	28.2	13.0	3.4	21.7	N.P.	.032	A-1-a			23.7		
11022	34S	8W	SW	SE	5	F	U.S.A.- B.L.M.	Bor.,B.G.	Alluvial Fan					Drilling necessary to evaluate prospect																		
11023	34S	9W	NE	NW	13	P			Flood Plain	450,000		0-1	1965	Cut Bank	4-16	0.0	0.0	100.0	85.5	56.0	41.5*	16.0*	8.5	15	N.P.	.009	A-1-a	211	373	17.2	6.42	11.4
11024	34S	9W	SE	NW	13	P		B.G.,S.G.	Stream Channel	8,000		0-1	1957	Cut Bank		3.2	21.3	100		40.5	29.5	19.0	4.1	16.1	N.P.	.006	A-1-a			30.0		
11025	35S	9W	SE	SW	11	P		B.G.,S.G.	Alluvial Fan	5,000		1	1964*	Bank	2-8	0.0	13.9	100	76.2	48.4	42.2*	29.3*	6.4	17.0	N.P.	.001	A-1-a			30.1	12.13	6.10

* SAMPLES TESTED AFTER MID-1963 USE NO. 8 AND NO. 50 SIEVES RESPECTIVELY.

PITS AND POTENTIAL SITES - TEST DATA SHEET

LOCATION						OWNERSHIP		MATERIAL					TEST DATA - REPRESENTATIVE SAMPLE																			
																SIEVE ANALYSIS																
																BEFORE CRUSHING		PERCENT PASSING AFTER CRUSHING TO 1" MAX. SIZE										IMMERSION COMPRESSION AVG. P.S.I. LIME			SODIUM SULPHATE LOSS	
PIT OR SITE NUMBER	TOWNSHIP	RANGE	40 ACRE TRACT	QUARTER SECTION	SECTION	P = PRIVATE C = COMMERCIAL CO = COUNTY F = FEDERAL S = STATE	OWNER	USE OF MATERIAL	TYPE OF DEPOSIT	PRESENT ESTIMATED QUANTITY (CU. YDS.)	THICKNESS OF MATERIAL	DEPTH OF OVERBURDEN	DATE SAMPLED *	TYPE OF SAMPLE	DEPTH OF SAMPLE	> 3"	> 1"	1"	1/2"	NO. 4	NO. 10*	NO. 40*	NO. 200	LIQUID LIMIT	PLASTICITY INDEX	SWELL	A. A. S. H. O. CLASSIFICATION	WO/	W/	ABRASION 500 REV.	+4	-4
11026	35S	9W	NE	NE	15	F	U.S.A.-B.L.M.	B.G.,S.G.	Alluvial Fan	30,000	15	1-3	1962	Cut Bank	1-15	0.0	31.7	100.0	69.9	44.8	37.0	29.4	6.0	15.3	N.P.	.010	A-1-a			33.0		
11027	35S	9W	NW	NE	26	F	U.S.A.-B.L.M.	B.G.,Bor.	Alluvial Fan	100,000	10	2	1962	Cut Bank	3-25	2.6	16.8	100.0	72.5	43.4	34.3	23.9	9.5	19.9	0.7	.010	A-1-a			36.0		
11028	35S	9W	SE	NW	26	F	U.S.A.-B.L.M.	B.G.,S.G.	Alluvial Fan	Mined out			1961	Cut Bank		0.0	14.3	100.0	58.4	32.3	26.0	20.4	10.4	20.4	N.P.	.012	A-1-a			30.86		
11029	35S	9W	NE	SW	26	P	J.H. Mitchell	B.G.,S.G.	Alluvial Fan	Mined out			1958	Cut Bank		5.0	26.6	100.0		30.7	23.1	16.9	7.3	32.3	N.P.	.028	A-1-a			36.12		
11030	35S	9W	NE NW	SW SE	34	P(?)		Bor.,B.G.	Talus	200,000	3	1-2	1960		2-10	0.0	35.9	100.0		37.1	28.4	20.5	13.8	19.8	3.8	.042	A-1-a			49.34		
11031	36S	9W	NE	SW	34	P(?)		B.G.	Talus	10,000	2	0-1	1961	Test Hole	0-30	0.0	33.9	100.0	66.5	29.8	17.7	9.2	3.4	29.4	6.4		A-2-4			17.0		
11032	36S	9W	SW	SW	2	P	J.S. Holyoak	B.G.,S.G.	Alluvial Fan	12,000	20	0-1	1959	Cut Bank	1-10	9.8	42.2	100.0	67.9	43.7	37.2	30.4	8.8	17.8	N.P.	.015	A-1-b			28.5		
11033	36S	9W	E½	SW	12	F	U.S. Forest Service	B.G.,S.G.	Talus	35,000	0-10	0	1960	Cut Bank	0-7	3.3	41.0	100.0		27.9	18.6	10.9	7.3	21.4	N.P.	.035	A-1-a			15.92		
11034	36S	9W	SW	NE	14	F	U.S. Forest Service	Bor.	Alluvial Fan	7,000		0-1	1960			26.3	55.9	100.0		43.2	34.5	24.7	15.7	29.2	8.3	.227	A-2-4			51.6		
11035	37S	9W	NW	SW	14	F	U.S. Forest Service	Bor.,B.G.	Talus	50,000	15	0-1	1957	Cut Bank		0.0	77.6	100.0		26.0	16.7	10.2	6.4	20.4	3.2	.032	A-1-a			40.78		
11036	35S	10W	E½	NE	10	P	J.R. Thompson	Maintenance B.G.,S.G.	Cinder Cone	200,000	40	0																				
11037	35S	10W	NW	NE	17	F	U.S.A.-B.L.M.	Bor.,	Alluvial Fan	200,000	8	2	1958	Cut Bank				100.0		70.6	54.1	31.5	14.9	26.1	N.P.	.040	A-1-b					
11038	35S	10W	SW	NE	18	P	C. Parry	B.G.	Alluvial Fan	15,000	8	1-2	1964*	Cut Bank	1-6	5.2	14.2	100.0	86.0	64.5	54.3*	29.4*	15.6	26	2	.013	A-1-b	111	208	24.18	6.68	13.14
11039	35S	11W	N½	NE	35	S	Department of Highways	Bor.,B.G.	Alluvial Fan	350,000	10	0	1964	Test Hole	2-11	0.0	17.0	83.0		58.0	51.0	42.0	19.0		N.P.	0	A-1-b					
11040	35S	11W	SE	SE	35	P	C. Parry	Bor.,B.G.	Alluvial Fan	75,000	15	0-2	1950	Cut Bank			11.8	100.0	61.8	21.7	16.8	13.6	6.1							29.8	16.29	4.8
11041	36S	11W	N½ W½	NW NE	3	S,F,P	Highway Dept. H.S. Jones	Bor., B.G.,S.G.	Flood-plain	1,500,000	10	0-2	1964*	Test Hole	1-10	7.7	32.3	100.0	62.2	35.5	29.3*	11.8*	3.1	18.0	N.P.	.001	A-1-a	143	351	30.8	13.4	13.7
11042	36S	11W	S½	SW	4	C	Parry Sand &.Gravel Co.	Con. Agg. B.G.,S.G.	Flood-plain	Ample	10	1-5	1963	Cut Bank		0.0	22.1	100.0	67.0	38.8	27.6	18.8	3.3	15.1	N.P.	.014	A-1-a			29.2	17.2	13.3
11043	36S	11W	NE	SE	8	F	U.S.A.-B.L.M.	Bor.	Flood-plain	35,000	5	2	1964	Test Hole	2.5-8	0.0	8.0	92.0		66.0	61.0	NOT CRUSHED 52.0	24.0	21	N.P.	0.5	A-1-a					
11044	36S	11W	SE	SE	8	F	U.S.A.-B.L.M.	Bor.	Alluvial Fan	40,000	10	0	1964	Test Hole		0.0	7.3	92.7		74.8	69.7	NOT CRUSHED 59.7	34.0	22.3	3.6		A-2-4					
11045	36S	11W	SE	SE	9	P		Bor.	Valley Fill	1,000,000	10	0-1	1964	Test Hole	0-10	0.0	6.0	94.0		69.0	60.0	NOT CRUSHED 48.0	24.0	22	N.P.	0	A-2-4					
11046	36S	11W	NE NW	NW NE	15	P		Bor.	Flood-plain	48,000	6	0-1	1964	Test Hole	1-9	0.0	41	59		33	29	NOT CRUSHED 22	9		N.P.		A-1-a					
11047	36S	11W	NE	SW	15	P		Bor.	Valley Fill	100,000	10		1964	Test Hole	4-9	0.0	4	96		63	56	NOT CRUSHED 45	28	28	9.0	0	A-2-4					
11048	36S	11W	N½	NW	22	P	E.W. Leigh	Bor.	Alluvial Fan	1,000,000	10	0-1	1964	Test Hole	3-9	0.0	24	76		45	40	NOT CRUSHED 32	16	21	5	0	A-1-b					
11049	36S	10W	W½	SE	17	F	U.S.A.-B.L.M.	B.G.,Bor.	Alluvial Fan	200,000	4		1964*	Cut Bank		4.4	17.5	100.0	82.3	55.8	46.2*	33.2*	12.9	17	N.P.	.001	A-1-b				10.26	8.70
11050	36S	11W	N½	NW	32	P	K. Middleton	Bor.	Valley Fill	90,000	8	0-1	1964	Test Hole	1-8	0.0	18.6	71.4		36.4	30.6	NOT CRUSHED 21.4	4.3		N.P.	0	A-1-a					

* SAMPLES TESTED AFTER MID-1963 USE NO. 8 AND NO. 50 SIEVES RESPECTIVELY.

PITS AND POTENTIAL SITES-TEST DATA SHEET

LOCATION						OWNERSHIP		MATERIAL					TEST DATA-REPRESENTATIVE SAMPLE																			
																SIEVE ANALYSIS																
																BEFORE CRUSHING		PERCENT PASSING AFTER CRUSHING TO 1" MAX. SIZE										IMMERSSION COMPRESSION AVG. P.S.I. LIME			SODIUM SULPHATE LOSS	
PIT OR SITE NUMBER	TOWNSHIP	RANGE	40 ACRE TRACT	QUARTER SECTION	SECTION	P = PRIVATE C = COMMERCIAL CO = COUNTY F = FEDERAL S = STATE	OWNER	USE OF MATERIAL	TYPE OF DEPOSIT	PRESENT ESTIMATED QUANTITY (CU. YDS.)	THICKNESS OF MATERIAL	DEPTH OF OVERBURDEN	DATE SAMPLED *	TYPE OF SAMPLE	DEPTH OF SAMPLE	> 3"	> 1"	1"	1/2"	NO. 4	NO. 10 *	NO. 40 *	NO. 200	LIQUID LIMIT	PLASTICITY INDEX	SWELL	A. A. S. H. O. CLASSIFICATION	WO/	W/	ABRASION 500 REV.	+4	-4
11051	36S	11W	NE	SW	32	P	R. Middleton	Bor.	Alluvial Fan	300,000	10	0-1	1964	Test Hole	3-10	13.8	26.8	73.2		NOT CRUSHED 49.8	45.3	38.1	11.5		N.P.		A-1-b					
11052	36S	11W	NE	SW	31	P	R. Middleton	B.G.,S.G.	Alluvial Fan	175,000	10	1-2	*1964	Cut Bank	5-18	6.2	32.7	100	70.3	40.9	*32.5	*20.1	3.9	17.0	N.P.	.001	A-1-a	387	493	26.0	7.1	16.0
11053	36S	11W	SW	SW	31	P	I. Cox	B.G.,S.G.	River Terrace	240,000	15	0	1963	Cut Bank		8.2	36.6	100	81.5	51.6	43.3	37.6	12.2	16.4	N.P.	.011	A-1-b	165	250	26	9.5	7.6
11054	37S	12W	NW	NE	1	F	U.S.A.-B.L.M.	Bor.	Alluvial Fan	200,000	10	0	1964	Test Hole	1-10	0.0	4.4	95.6		NOT CRUSHED 76.1	67.0	48.8	21.5	21.2	N.P.	0	A-1-b					
11055	37S	12W	N½ S½	SW NW	12	F	U.S.A.-B.L.M.	B.G.,Bor.	Alluvial Fan	450,000	12	0-1	*1963	Test Hole		0.0	19.5	100	82.2	61.3	*54.0	*37.0	9.5	15.1	N.P.	.008	A-1-b	167	240	47.5	41.0	21.6
11056	37S	12W	NE	SE	11	P	A.L. Graff	Bor.	Alluvial Fan	250,000	20	0	1963	Test Hole		0.0	0.0	100		88.7	86.2	79.8	52.9	21.3	1.4	1.2	A-4(4)					
11057	37S	12W	SW	NE	22	F	U.S.A.-B.L.M.	Bor.	Valley Fill	Mined out			1964	Test Hole	0-7	0.0	6.0	94		NOT CRUSHED 77	69	49	29	27	8		A-2-4					
11058	37S	12W	N½	SE	28	P	G.B. Anderson	Bor.	Alluvial Fan	200,000	20	0.5	1963	Test Hole	0-7	0.0	0.0	100		99.5	97.1	86.8	73.8	24.1	3.4	0.2	A-4(8)					
11059	37S	12W	NW	NW	33	P	G. A. Berry	B.G.,Bor.	River Terrace	100,000	8	1	*1964	Test Hole	1-8	13.3	50.0	100	71.3	46.1	*39.0	*23.6	10.1	18	N.P.	.010	A-1-a	189	328	37	12.6	14.7
11060	38S	12W	NW	NW	9	P	H. H. Gubler	Bor.	River Terrace	150,000	20	0-1	1963	Test Hole	0-20	0.0	0.0	100		100	99.7	94.0	60.5	17.3	3.2	1.0	A-4(5)					
11061	38S	12W	SE	SE	9	P	R.J. Williams	B.G.,Bor.	Alluvial Fan	150,000	10	0-1	*1964			3.7	31.4	100	65.8	34.7	*27.5	*17.4	10.1	24	2	.007	A-1-a	79	353	30	16.4	16.4
11062	38S	12W	E½	SE	8	P	D.E. Davies	Bor. B.G.,S.G.	Flood-plain	300,000	10	2	*1964	Cut Bank		0.0	21.0	100	76.1	48.9	*42.2	*30.4	10.8	20.3	N.P.	.007	A-1-a	118	247	32.2	8.99	5.34
11063	38S	12W	NE	NE	9	P	D.E. Davies	B.G.,Bor.	Flood-plain	See M1-2 Form	15	2	*1964	Stock Pile				100	92.1	85.0	*67.9	*18.3	4.1	15	N.P.	0.14	A-1-a	93	232	40.9	32.2	25.0
11064	38S	12W	SW	NE	16	S	State Land Board	B.G.,Bor.	Talus	35,000	15	0-1	*1963	Test Hole		6.3	40.6	100	72.3	42.5	*33.4	*19.4	11.8	21.1	5.2	.008	A-1-a	**	209	34.0	24.1	10.0
11065	38S	12W	SE	SE	17	P	D.E. Davies	Bor.	Slope Wash	50,000	4	0-1	1957	Test Hole	0-12	16.9	29.6	87.3		NOT CRUSHED 66.6	55.3	41.9	30.8	22.1	4.5	0.32	A-2-4					
11066	31S	10W	SE	NW	14	F	U.S.A.-B.L.M.	B.G.,S.G.	River Terrace	30,000	15	1-2	*1964	Cut Bank	5-15	0.0	0.0	100.0	80.2	52.4	*41.9	*17.1	8.8	17	N.P.	.003	A-1-a			25.5	11.0	11.0
11067	31S	10W	NE	SE	27	F	U.S.A.-B.L.M.	B.G.,S.G.	River Terrace	75,000	20	2-4	*1964	Cut Bank		0.0	10.1	89.9	73.1	49.0	*39.8	*14.8	3.1	23	N.P.	.013	A-1-a					35.7
11068	33S	10W	NW	SW	31	P	S. Benson	B.G.,S.G.	River Terrace	75,000	10	1-3	*1964	Cut Bank				100	73.0	18.7	*8.8	*3.7	2.1				A-1-a			24.0	2.94	12.27
11069	33S	11W	NE	SW	31	F	U.S.A.-B.L.M.	B.G.,S.G.	River Terrace	16,000	6	1-3	*1964	Cut Bank	0-6	0.0	0.0	100.0	90.5	74.6	*64.8	39.0	18.2	21	N.P.	.008	A-1-b					16.9
11070	34S	11W	S½	SW	30	P	A. Williams	Bor. B.G.,S.G.	Alluvial Fan	350,000	15		1962	Cut Bank		0.0	3.8	100	85.9	68.3	56.4	36.0	9.4	19.5	N.P.	.011	A-1-b			32.0		
11071	34S	12W	SE	SE	3	F	U.S.A.-B.L.M.	B.G.,Bor.	Alluvial Fan	200,000	4	0-1	1965	Cut Bank	0-5	0.0	0.0	100.0	93.4	83.2	*72.2	*20.9	3.9	18	N.P.	.004	A-1-a			24.8	12.5	12.5
11072	34S	12W	W½	NE	3	F	U.S.A.-B.L.M.	B.G.,Bor.	River Terrace	40,000	10	0-1	1946	Test Hole	3-7		20.4	100	69.9	31.0	24.9	17.2	7.5	24.4	5.8	.045	A-1-a			29.82		
11073	33S	12W	NE	SE	30	P		B.G.,S.G.	Lake Terrace	200,000	10	0-1	1954			0.0	0.0	100		70.1	52.0	25.1	4.8	16.3	N.P.	.020	A-1-a			30.4		
11074	32S	14W	SW	NW	19	F	U.S.A.-B.L.M.	B.G.,S.G.	Alluvial Fan	30,000	10	0	1946	Cut Bank			6.1	100	90.3	75.2	54.2	13.9	3.8	18.5	N.P.	.006	A-1-a			27.1		
11075	36S	12W	SE SW	NE NW	25 30			B.G.,S.G.	Alluvial Fan	300,000	15	0-1	1962	Test Hole		0.0	14.7	100	84.9	61.7	47.9	26.5	9.0	19.0	N.P.	0.10	A-1-a			30.0		

* SAMPLES TESTED AFTER MID-1963 USE NO. 8 AND NO. 50 SIEVES RESPECTIVELY.

** Collapsed

PITS AND POTENTIAL SITES - TEST DATA SHEET

LOCATION: PIT OR SITE NUMBER	TOWNSHIP	RANGE	40 ACRE TRACT	QUARTER SECTION	SECTION	OWNERSHIP: P = PRIVATE C = COMMERCIAL CO = COUNTY F = FEDERAL S = STATE	OWNER	MATERIAL: USE OF MATERIAL	TYPE OF DEPOSIT	PRESENT ESTIMATED QUANTITY (CU. YDS.)	THICKNESS OF MATERIAL	DEPTH OF OVERBURDEN	TEST DATA - REPRESENTATIVE SAMPLE: DATE SAMPLED *	TYPE OF SAMPLE	DEPTH OF SAMPLE	SIEVE ANALYSIS: BEFORE CRUSHING > 3"	BEFORE CRUSHING > 1"	PERCENT PASSING AFTER CRUSHING TO 1" MAX. SIZE: 1"	1/2"	NO. 4	NO. 10 *	NO. 40 *	NO. 200	LIQUID LIMIT	PLASTICITY INDEX	SWELL	A. A. S. H. O. CLASSIFICATION	IMMERSSION COMPRESSION AVG. P.S.I. LIME WO/	LIME W/	ABRASION 500 REV.	SODIUM SULPHATE LOSS +4	SODIUM SULPHATE LOSS -4
11076	37S	14W	SE	NE	2	S	Utah State Land Board	B.G.,S.G.	Alluvial Fan	20,000	10		1946	Test Hole			34.0	100	69.3	32.3	22.0	9.2	3.8	23.9	N.P.	.032	A-1-a			28.1		
11077	36S	14W	SW	NW	20	F	U.S.A.- B.L.M.	B.G.	Alluvial Fan	400,000	20	1	*1964	Cut Bank		0.0	2.5	100	91.0	64.0	*43.0	10.5	5.0	21	N.P.	.008	A-1-a	154	337	23.1	14.3	15.25
11078	36S	15W	NE	SW	16	P	J.T. Forsythe	B.G.,S.G.	Alluvial Fan	160,000	20	1	1948	Test Hole	0-8		8.2	100		70.5	56.4	17.4	3.7	19.3	N.P.	.013	A-1-a			29.1		
11079	36S	16W	SE	NE	17			Bor.	Alluvial Fan	32,000	10	1				0.0	0.0	100			91.3	69.4	45.6	26.4	7.7		A-4(4)					
11080	35S	16W	NE	NW	33	P	C. T. Holland C. Twitchell	Bor.	Lake Floor	40,000	5	0	1954	Test Hole		0.0	0.0	100		91.9	82.4	52.1	22.7	26.9	N.P.	0.1	A-2-4					
11081	35S	16W	SW	SW	21	P	H. A. Wood J.C. McGarry	Bor	Dune Sand	50,000	3	0	1954			0.0	0.0	100	100	100	98.3	83.2	48.9	23.9	1.9	1.5	A-4(2)					
11082	35S	16W	SW	SW	16	S, Co	Iron Co., U.S.D.H.	B.G.,S.G.	Lake Terrace	30,000	10	3-5	1954	Cut Bank	6-10			100		69.3	58.0	25.3	7.5	21.0	N.P.	.010	A-1-a			26.7		
11083	35S	16W	NW	NW	3	P		Bor. B.G.,S.G.	Lake Terrace	50,000	5	2-4	1954	Cut Bank		0.0	0.0	100		72.4	54.3	13.7	2.3	22.3	N.P.	.023	A-1-a			29.9		
11084	34S	16W	SE	SE	8	P	J.C. McGarry	Bor.	Lake Floor	50,000	7	0-1	1954	Test Hole	2-8	0.0	0.0	100		93.1	78.8	41.2	11.0	20.3	N.P.	.010	A-1-b					
11085	33S	16W	SW	NW	27	Co.	Iron Co.	B.G.,S.G.	Lake Terrace	100,000	2-5	2-4	1957	Cut Bank	0-8	0.0	1.5	100		65.3	48.6	17.6	6.6	19.8	N.P.	.017	A-1-a			28.6		
11086	35S	17W	SW	NW	26	F	U.S.A.- B.L.M.	B.G., Bor.	Alluvial Fan	200,000	15	1	*1964	Cut Bank		0.7	11.7	100	79.7	55.0	*45.2	*21.2	13.6	24	3	.006	A-1-a	48	163	21.4	8.42	10.68
11087	35S	18W	NE	SE	11	F	U.S.A.- B.L.M.	B.G., Bor.	River Terrace	325,000	12	2	*1964	Cut Bank		0.0	18.8	100	80.7	57.7	*49.0	*17.7	11.2	23	5	.009	A-1-a	247	368	24.9	8.34	10.38
11088	34S	19W	NE	NE	25	P	B. Thorley	B.G.,S.G.	Alluvial Fan	300,000	10	1	1958			11.0	22.7	100		68.6	57.6	33.6	11.6	21.9	N.P.	.010	A-1-a			26.6		
11089	34 34S	19W 18W	SE NW	NE SW	36 31	P	R. Thorley	Bor.	Flood Plain	300,000	5	1	1958	Cut Bank		0.0	23.5	100		53.4	41.9	23.4	9.7	21.4	N.P.	.008	A-1-a			29.8		
11090	35S	19W	NW	NW	2	S	Utah State Land Board	B.G.,S.G.	River Terrace	300,000	20	1	1941	Test Hole	0-10		29.5	100	83.6	61.0	42.2	12.7	4.6			.062				26.8		
11091	35S	19W	NE	SW	9	F	U.S.A.- B.L.M.	B.G.,S.G.	Alluvial Fan	550,000	25	0	*1964	Cut Bank		4.3	14.3	100	89.1	69.1	*60.0	*23.5	10.1	19	N.P.	.004	A-1-a			26.5	10.5	10.40

* SAMPLES TESTED AFTER MID-1963 USE NO. 8 AND NO. 50 SIEVES RESPECTIVELY.

PITS AND POTENTIAL SITES-TEST DATA SHEET

LOCATION						OWNERSHIP		MATERIAL					TEST DATA-REPRESENTATIVE SAMPLE																			
PIT OR SITE NUMBER	TOWNSHIP	RANGE	40 ACRE TRACT	QUARTER SECTION	SECTION	P = PRIVATE C = COMMERCIAL CO = COUNTY F = FEDERAL S = STATE	OWNER	USE OF MATERIAL	TYPE OF DEPOSIT	PRESENT ESTIMATED QUANTITY (CU. YDS.)	THICKNESS OF MATERIAL	DEPTH OF OVERBURDEN	DATE SAMPLED *	TYPE OF SAMPLE	DEPTH OF SAMPLE	SIEVE ANALYSIS								LIQUID LIMIT	PLASTICITY INDEX	SWELL	A. A. S. H. O. CLASSIFICATION	IMMERSSION COMPRESSION AVG. P.S.I.		ABRASION 500 REV.	SODIUM SULPHATE LOSS	
																BEFORE CRUSHING		PERCENT PASSING AFTER CRUSHING TO 1" MAX. SIZE										LIME				
																> 3"	> 1"	1"	1/2"	NO. 4	NO. 10*	NO. 40*	NO. 200					WO/	W/		+4	-4

* SAMPLES TESTED AFTER MID-1963 USE NO. 8 AND NO. 50 SIEVES RESPECTIVELY.

PITS AND POTENTIAL SITES - TEST DATA SHEET

LOCATION						OWNERSHIP		MATERIAL					TEST DATA - REPRESENTATIVE SAMPLE																		
																SIEVE ANALYSIS															
																BEFORE CRUSHING		PERCENT PASSING AFTER CRUSHING TO 1" MAX. SIZE										IMMERSSION COMPRESSION AVG. P.S.I.			SODIUM SULPHATE LOSS	
																												LIME				
PIT OR SITE NUMBER	TOWNSHIP	RANGE	40 ACRE TRACT	QUARTER SECTION	SECTION	P = PRIVATE C = COMMERCIAL CO = COUNTY F = FEDERAL S = STATE	OWNER	USE OF MATERIAL	TYPE OF DEPOSIT	PRESENT ESTIMATED QUANTITY (CU. YDS.)	THICKNESS OF MATERIAL	DEPTH OF OVERBURDEN	DATE SAMPLED *	TYPE OF SAMPLE	DEPTH OF SAMPLE	> 3"	> 1"	1"	1/2"	NO. 4	NO. 10*	NO. 40*	NO. 200	LIQUID LIMIT	PLASTICITY INDEX	SWELL	A. A. S. H. O. CLASSIFICATION	WO/	W/	ABRASION 500 REV.	+4	-4
11092	34S	8W	NW	NW	6	P	Graft	Borrow	Fan	980,000	12	0	1968	Test Hole	0-17			100		98	97	96	61	NP	NP	.75	A-4(5)					
11093	33S	8W	SE SW	NE NW	20 21	P	Davenport & Mitchell	Borrow		330,000	7	3-8	1967	Test Hole	6-11	100		80		40	31	17	7	NP	NP	.04	A-1-a(0)					
11094	34S	9W	SE NE	NW SW	17	P	Adams & Corry	B.G.,S.G.		775,000	16	3-10	1967	Test Hole	8-12			100		99	98	60	60	NP	NP	.24	A-4(5)					
11095	34S	9W	NE NW	NE NW	15 14	P	C. Taylor	Borrow		475,000	15	0	1965	Test Hole	0-11			100		97	96	92	41	NP	NP	.35	A-4(4)					
11096	34S	9W	NE	SE	21	P	D.W. & V.M. Adams	Borrow		590,000	12	½	1967	Test Hole	6-11	100		93		86	84	81	27	NP	NP	0.0	A-2-4(0)					
11097	34S	9W	SE	SW	20	P	Mortensen	Borrow		568,000	11	0	1967	Test Hole	8-10	100		91		65	60	56	38	22	4	0.0	A-4(1)					
11098	34S	9W	N½	SW	30	F	B.L.M.	B.G.,S.G.		327,000	10	1	1965	Test Hole	1-10	100		61		32	26	18	6	24	3	.18	A-1-a(0)					
11099	34S	10W	SW	SE	25	F	B.L.M.	Borrow		160,000	10	0	1966	Test Hole	0-3	100		79		56	50	42	18	25	5	0.0	A-1-b(0)					
11100	35S	11W	NE	SE	24	F	B.L.M.	B.G.,S.G. Riprap			12	1-2	1966	Test Hole	3-7	100		91		69	55	39	12	NP	NP	0.0	A-2-4(0)					
11101	35S	10W	S½	NE	3	P	Herbert B. White	Borrow		2M	30	0	1965	Test Hole	1-11	100		75		40	31	18	5	NP	NP		A-1-a(0)					
11102	35S	11W	SE NE	NW SW	25	F&P	B.L.M. Esplin	Gravel		400,000	10	1-2	1966	Test Hole	15-55			100		50			13	NP	NP	.002	A-1-a(0)	119	273	34	(11.35)	
11103	35S	11W	SW	SW	34	F	B.L.M.	Gravel		300,000	11	1-2	1968	Test Hole	5-10	98	70	100		46			5	NP	NP		A-1-a(0)	163	385	30	(6.99)	
11104	35S	11W	NE	SE	35			Borrow		74,000	12	0-1	1968	Test Hole	3-12			83		58	51	45	18	NP	NP	.07	A-1-b(0)					
11105	36S	11W	N½	NE	27	F	B.L.M.	Borrow		110,000	11	0	1965	Test Hole	4-9	100		91		72	63	52	29	20	NP	0.0	A-2-4(0)					
11106	31S	7W		SE	20	F	B.L.M.	B.G.,S.G.					1968			95	59	99	73	39	29	8	4	NP	NP	.004	A-1-a(0)	150	226	22	3.37	7.30
11107	31S	7W		W½	11	F	B.L.M.	B.G.,S.G.		528,000	10	1-4	1968	Test Hole	1.5-10.5	94	62	99	70	41	25*	11*	5	NP	NP	.002	A-1-a(0)	184	303	24	1.64	6.21
11108	31S	7W		NW	31			B.G.,S.G.					1968		3-12	90	56	100	70	37	29	9	4	NP	NP	.002	A-1-a(0)	119	227	23	1.41	3.39
11109	35S	11W	SW	SE	26	S	Road Comm.	Borrow		000			MINED OUT																			
11109	35S	11W	N½	NE	35	S	Road Comm.	Borrow					1966		0.2	100		99		95	93	85	25	NP	NP		A-2-4(0)					
11110	36S	11W	SW	NE	3	P	Homer S. Jones	B.G.,S.G.		000			MINED OUT																			
11110	36S	11W	NW N½	NE NW	3	P	J.H. Nelson Road Comm.	B.G.,S.G.	Stream Channel				1966		6-15	100		76		28	19	12	2	NP	NP		A-1-a(0)					
11111	36S	11W	SE	SW	3			B.G.,S.G.	Stream Channel	000			MINED OUT																			
11112	31S	7W		SE	20	F	B.L.M.	B.G.,S.G.	Alluvial Fan	418,000	9	5	1969	Test Hole		13	20	99	63	34	26	17	3	NP	NP	.008	A-1-a(0)	91	242	21		
11113	32S	7W	NE	SW	6			Borrow		125,000	13	0.1	1968	Test Hole	1-9	100		81		55	45	25	8	NP	NP		A-1-a(0)					
11114	35S	10W	NE	SE	9			Borrow					RECEIVED PIT REPORT FORM MAY 1970																			

* SAMPLES TESTED AFTER MID-1963 USE NO. 8 AND NO. 50 SIEVES RESPECTIVELY.

PITS AND POTENTIAL SITES-TEST DATA SHEET

LOCATION						OWNERSHIP		MATERIAL					TEST DATA-REPRESENTATIVE SAMPLE																			
																SIEVE ANALYSIS																
																BEFORE CRUSHING		PERCENT PASSING AFTER CRUSHING TO 1" MAX. SIZE										IMMERSION COMPRESSION AVG. P.S.I.			SODIUM SULPHATE LOSS	
																												LIME				
PIT OR SITE NUMBER	TOWNSHIP	RANGE	40 ACRE TRACT	QUARTER SECTION	SECTION	P = PRIVATE C = COMMERCIAL CO = COUNTY F = FEDERAL S = STATE	OWNER	USE OF MATERIAL	TYPE OF DEPOSIT	PRESENT ESTIMATED QUANTITY (CU. YDS.)	THICKNESS OF MATERIAL	DEPTH OF OVERBURDEN	DATE SAMPLED *	TYPE OF SAMPLE	DEPTH OF SAMPLE	> 3"	> 1"	1"	1/2"	NO. 4	NO. 10 *	NO. 40 *	NO. 200	LIQUID LIMIT	PLASTICITY INDEX	SWELL	A. A. S. H. O. CLASSIFICATION	WO/	W/	ABRASION 500 REV.	+4	-4
11115	34S	10W	NW	SE	35			Borrow					RECEIVED PIT EVALUATION REPORT FORM MAY 1970																			
11116	31S	7W	SE NE	SE NE	3 10	F	B.L.M.	Borrow		250,000	8	1	1970	Test Hole	1-14			70		45	37*	24*	11	NP	NP	0.00	A-1-a(0)					
11117	34S	8W		NW	30	F	B.L.M.	Gravel		100,000	9	0-1	1970	Test Hole	0-14	97	73	99		47			12.9	NP	NP	0.001	A-1-a(0)			33		

* SAMPLES TESTED AFTER MID-1963 USE NO. 8 AND NO. 50 SIEVES RESPECTIVELY.

AREAS INVESTIGATED BUT REJECTED AS CURRENTLY POTENTIAL SITES

LOCATION						OWNER	TYPE OF DEPOSIT	REPRESENTATIVE SAMPLE																		REASON FOR REJECTION
											SIEVE ANALYSIS										IMMERSION COMPRESSION AVE. P.S.I LIME			SODIUM SULPHATE LOSS		
											BEFORE CRUSHING		% PASSING AFTER CRUSHING TO 1 INCH MAXIMUM SIZE													
SITE NUMBER	TOWNSHIP	RANGE	40 ACRE TRACT	QUARTER SECTION	SECTION			DATE SAMPLED	TYPE OF SAMPLE	DEPTH OF SAMPLE	>3"	>1"	1"	1/2"	No. 4	No. 10	No. 40	No. 200	LIQUID LIMIT	PLASTICITY INDEX	WO/	W/	ABRASION 500 REV.	+4	-4	
11-A	36S	9W	SE	SE	14	U. S. Forest Service	Stream Channel	1961	T.H	0-4	15.3	44.8	100	54.6	38.0	28.9	18.9	4.7	37.5	13.0			42.9			Excessive Wear, L.L., P.I.
11-B	36S	8W	SE	NW	3	U. S. Forest Service	Valley Fill	1961			0.0	19.2	100	79.6	54.5	41.5	24.4	9.5	33.9	11.8			25.5			Excessive L.L., P.I., Swell
11-C	36S	9W	SE	NW	36	U. S. Nat. Park Service	Talus	1960	Cut Bank		4.2	46.0	100	79.3	47.1	36.6	27.1	14.2	26.2	9.8			38.0			Excessive Wear, L.L., P.I., Swell